G. Schernewski & N. Löser (eds.): Managing the Baltic Sea.
***Coastline Reports 2 (2004)**, ISSN 0928-2734*
S. 9 - 15

National ICZM strategy and initiatives in Lithuania

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Abstract

Lithuania has one of the shortest shoreline among European countries. Lithuanian coastal zone belongs to the southeast Baltic region of graded coasts, which took their present shape during Pleistocene and Holocene. The shoreline is relatively stable. From the administrative point of view it is very convenient that the entire coastal zone of Lithuania belongs to one (Klaipeda) county. There are no special agencies or institutions in Lithuania, which were responsible for planning, implementation and evaluation of ICZM. In recent years Lithuanian coastal zone management policy could be characterized by a very positive breakthrough. The Law of the Coastal Zone was adopted by the Lithuanian Parliament on July 2, 2002. It was followed by the National ICZM Programme, which was approved by the Ministry of Environment in September 2003. The Lithuanian mainland coastal zone between Klaipeda Seagate and the Latvian border is delimited by at least 100 m wide belt stretching from the mean water level mark landwards. This belt must definitely encompass the beach, the coastal cliff, the foredune and the hinterdune. The Lithuanian coastal zone also encompasses the entire Curonian spit from Klaipeda Seagate to the Russian border. The seaward boundary of the coastal zone is limited by the 20 m depth line. The main ICZM principles as described in the National Coastal Zone Management Programme are: 1. Conservation of natural coastal landscapes and coastal processes. 2. Integration of coastal conservation and coastal use objectives. 3. Littoral cells approach. 4. Differentiation of coastal management measures according to specific priorities for coastal conservation and wise use on a particular coastal strip. 5. Monitoring of coastal processes.

1 Introduction

Lithuania is located on the south-east coast of the Baltic Sea (Fig. 1).

Figure 1: Lithuanian Baltic coast can be described as a combination of microtidal sedimentary coastand soft rock coast. Within these major coastal types coastal formations and habitats of sandy beaches with bare and vegetated sand dunes prevail.

It is predominantly continental country with only 90 kilometres of the marine coastline. Only three other European countries - Montenegro, Slovenia and Belgium have a shorter marine coastline that the one of Lithuania.

In spite of the short length of the waterfront, the coastal zone of Lithuania encompasses a vast and very diverse coastal region with sand dunes, estuaries, large river delta and coastal lagoon. Therefore the integrated coastal zone management approach in the Lithuanian case covers a wide range of issues and target areas - from conservation and maintenance of pristine deltaic nature reserves located 60 kilometres inland from the coast to the development of industrial sea ports and seaside resorts.

2 Description of the Geographical Area

Lithuanian coastal zone belongs to the southeast Baltic region of graded coasts, which took their present shape during Pleistocene and Holocene. Within this strip of coasts, which stretches northwards from the Cape Taran in Sambian peninsula deposits of glacial and marine sand accumulation prevail.

Four different dynamic types of coasts could be distinguished along the Lithuanian Baltic coast.

- Slight accretion prevails between Nida and Juodkrante. Shoreline is relatively stable there. The beach is relatively wide, covered by medium-sized sand grains with admixture of gravel. It is framed by the 6 to 8 m high artificial foredune. Nearshore is relatively shallow. It has sandy bottoms with *Macoma baltica* communities. Glacial deposits appear on the bottom surface at the depth of 16-18 m, i.e., in the euphotic zone. The foredune is covered by marram grass, sea rocket and other perennial grasses, while the dune blow-outs are overgrown mainly by willows. The foredune was artificially created in the 19th century in order to protect coastal villages from the devastating sand drift. It stretches along the entire Lithuanian Baltic coast except few places north of Klaipeda.
- The coastal strip between Juodkrante and Melnrage is characterized by a relatively strong accretion. The average advance of the shoreline to the sea is up to 2 m there (except the places adjacent to the Seagate of the Klaipeda harbour). The beach is wide (50-70 m), covered by a well-sorted medium-sized sand. It is framed by a 12 to 14 m high artificial foredune. The nearshore is very shallow, it has sandy bottoms with *Macoma baltica* communities down to the 20-30 m depth.
- The coastal strip between Melnrage and Nemirseta is characterized by a moderate erosion and shoreline retreat up to 1 m annually. Glacial coastal scarps and bluffs prevail here covered with the sand of the Holocene Aeolian accumulation and forming coastal formations, which are unique for Lithuania. A steep ancient slope of the Holocene marine terrace formed by the Litorina sea transgression forms another important coastal landscape amenity with numerous coastal wetlands, rivulets and dense mixed old forest plantations. It gradually descends down northwards and southwards from the parabolic dune of Olando kepure, where it reaches 25-29 m altitudes. The height of the coastal cliff near the Olando kepure is up to 24,4 m high at Karkle. The cliff is active, not covered by vegetation, with numerous traces of landslides and landslips, fallen trees and sliding bushes. A relative height of the ancient slope of the Holocene marine terrace varies from 8 to 11 m. The beach in the strip between Melnrage and Nemirseta is relatively narrow, 15-25 m wide, covered by mixed sediments, where the gravel prevails with admixture of medium-sized sand, pebble and boulders. The nearshore is relatively steep, covered by fine sand, it has a hard bench of boulders, pebble and gravel. Here on the varied hard bottom sediments covered by the communities of *Mytilus edulis* with the sufficient penetration of sunlight the most favorable conditions form for the greatest biodiversity in the entire eastern Baltic Sea area. Therefore this area is one of the most important spawning places for the Baltic herring. Below the hard bottom area in the aphotic zone of 25-30 m depth the conditions for the marine life are much worse.
- North of Nemirseta the grading of the coast during the series of the Baltic Sea transgressions all through the Holocene created favorable conditions for sand accretion. The shoreline is relatively stable (except the places adjacent to the Palanga pier and Butinge wastewater discharge pipeline). The beach is relatively wide (50-90 m), covered by a well-sorted medium-sized sand. The beach is framed by the 3 to 6 m high artificial foredune. The foredune is covered by marram grass, sea

rocket and other perennial grasses, while the dune blow-outs are overgrown mainly by willows. The nearshore is relatively shallow, it has sandy bottoms with *Macoma baltica* communities. Glacial deposits appear at the bottom surface at the depth of 4-6 m, i.e., still in the photic zone. Here also on the varied hard bottom sediments covered by the communities of *Mytilus edulis* with the sufficient penetration of sunlight favorable conditions form for the biodiversity. Therefore this area is also among the most suitable spawning places for the Baltic herring. Behind the foredune there is an ancient coastal accumulative plain covered with the sand of the Holocene Aeolian accumulation. The terrace is covered by numerous coastal wetlands, rivulets, pine-forest plantations. The major landmarks of this area are two parabolic dunes: Birute hill and Nagliai hill reaching 20 m altitude.

3 Results

3.1 Management of the Lithuanian Baltic coast

From the administrative point of view it is very convenient that the entire coastal zone of Lithuania belongs to one (Klaipeda) county, which consists of seven municipalities. Five of them (Klaipeda, Palanga, Neringa, Gargzdai and Silute) are located on the Baltic Sea and / or Curonian Lagoon coast.

There are no special agencies or institutions in Lithuania, which were responsible for planning, implementation and evaluation of ICZM. In the entire coastal zone of Lithuania, the interests of the state are represented by the Klaipeda County Governor's administration. Within their competencies, the territory of the coastal zone is administrated by the above mentioned five coastal municipalities.

Coastal (like any other) municipalities have the right to develop master and detailed spatial plans for their territory, which legally permit sectoral or integrated development in the coastal zone. However these two (master and detailed) spatial plans, and, through them, interests of municipality and private persons must be set in accordance with the state interests. These interests are pursued by the county administration and administrations of the state parks.

There are established three state parks in the coastal zone of Lithuania, i..e, protected areas with their own administrations, which are responsible to the Ministry of Environment (Kursiu nerija national park, Pajuris (Coastal) regional park and Nemunas delta regional park). They altogether cover app. 70% of the total coastal zone area. The administrations of the state parks in their activity must follow master plans of these protected territories, which have to be approved by the Government.

On the county level, integration of the coastal management through the supervision of spatial planning procedures is ensured by the spatial planning department of the Klaipeda County administration. Klaipeda County administration also arranges state and county planning process, which is the main legal tool for integration of coastal management, as well as for any other regulations, conservation and development related to the coast.

On the state level integration of coastal management is ensured by several departments at the Ministry of Environment. Of these Service Protected Areas, and the Department of Spatial Planning are the most relevant to the ICZM.

3.2 Legislation and policies of Lithuania relevant to coastal management and planning

In recent years Lithuanian coastal zone management policy could be characterized by a very positive breakthrough. The Law of the Coastal Zone was adopted by the Lithuanian Parliament on July 2, 2002. It was followed by the National ICZM Programme, which was approved by the Ministry of Environment in September 2003. Such radical measures were taken after series of devastating erosion events on the Lithuanian coast. Particularly devastating was the hurricane "Anatole" of December 1999 which had nearly swept away the beaches along the entire coastal zone of this country. The economic damage of "Anatole" upon the Lithuanian seacoast is given in Table 1.

Locality	Amount of damage	Description of damage
Smiltyne	120'000 EUR	Eroded seaward slope of the foredune on 5 km strip (200 thou. cub. m of sand washed away), destroyed stair and paths leading to the beach
Melnrage-Giruliai	100'000 EUR	Eroded seaward slope of the foredune on 4 km strip (150 thou. cub. m of sand washed away), destroyed stair and paths leading to the beach
Karkle	130'000 EUR	Eroded seaward slope of the foredune on 3 km strip (1 km of the foredune completely erased)), 50 thou. cub. m of sand and 15 thou. cub. m of till washed away, destroyed stair and paths leading to the beach
Palanga	430'000 EUR	Eroded seaward slope of the foredune on 10 km strip (1 km of the foredune completely erased)), 500 thou. cub. m of sand washed away, damaged promenade pier, destroyed stair and paths leading to the beach
Sventoji	170'000 EUR	Eroded seaward slope of the foredune on 14 km strip (350 thou. cub. m of sand washed away), destroyed stair and paths leading to the beach
TOTAL	950'000 EUR	Eroded seaward slope of the foredune on 36 km strip (2 km of the foredune completely erased), 1250 thou. cub. m of sand and 15 thou. cub. m of till washed away, damaged Palanga promenade pier, destroyed stair and paths leading to the beach

Table 1: Damage inflicted upon the Lithuanian coast by the December 4, 1999 storm

According to the Lithuanian Law of the Coastal Zone (2002) the objectives of the coastal zone management in Lithuania are the following: 1. To use wisely and to protect landscapes and rare species habitats of the Curonian spit (a World Heritage Site) and the Lithuanian mainland coast. 2. To ensure a sustainable use of the coastal zone for public and state needs. 3. To ensure conservation of coastal nature and culture heritage. 4. To provide favourable conditions for public use of coastal amenities for leisure purposes.

The Lithuanian coastal zone is delimited by at least 100 m wide belt of the mainland coast between Klaipeda Seagate and the Latvian border stretching from the mean water level mark landwards. This belt must definitely encompass the beach, the coastal cliff, the foredune and the hinterdune. The Lithuanian coastal zone, according to the Law also encompasses the entire Curonian spit from Klaipeda Seagate to the Russian border. The seaward boundary of the coastal zone is limited by the 20 m depth line. The land and the sea within the coastal zone is in the exclusive public property and belongs to the state, except those private lots of land, which have been established before the Law came into force. However these private lots should not be fragmented for sale, lease, mortgage or any other commercial use. The state has the priority right to buy those lots from the private owners.

An integrated management of the coastal zone, according to the Law, is ensured by the following spatial planning documents: 1. Special management plan of the "Kursiu nerija" national park. 2. Special management plan of the mainland coastal zone. 3. Master plans of Klaipeda and Neringa urban municipalities. Detailed plans of urban and rural settlements or parts of settlements within the following municipalities: Neringa, Palanga, Klaipeda urban and Klaipeda rural.

Any new exploitation of underground resources or new construction is fully forbidden within the entire Lithuanian coastal zone. Only reconstruction or regeneration of the existing buildings, or those buildings which are proved to exist in the past, or limited construction of small-scale seaside leisure amenities is allowed within the limits of the coastal zone. A permit for such intervention into the coastal zone can be issued by the Klaipeda Governor's Administration only after the obligatory public hearings and environmental impact assessment. Every permit must be finally approved by the Lithuanian Government (sic!). Any intervention into the coastal zone must ensure, that there will be no changes in the bottom topography and sediment drift conditions, which might negatively affect

neighbouring coastal strips. In order to assess long-term trends and changes in coastal zone development there should be introduced a comprehensive coastal monitoring system.

According to the National Coastal Zone Management Programme (2003), which was approved by the Ministry of Environment in September 2003, several important coastal management measures are anticipated, which are aimed to ensure introduction of ICZM principles.

The main ICZM principles as described in the National Coastal Zone Management Programme are: 1. Conservation of natural coastal landscapes and coastal processes. 2. Integration of coastal conservation and coastal use objectives. 3. Littoral cells approach. 4. Differentiation of coastal management measures according to specific priorities for coastal conservation and wise use on a particular coastal strip. 5. Monitoring of coastal development.

It is important to emphasize, that Lithuania is probably the only country in Europe, where the ICZM strategy for the whole seacoast within the national borders is based on a littoral cell approach. For that purpose the Baltic coastal zone of Lithuania is split into eleven management units and different ICZM measures are applied to various units. In all cases the priority is given to the conservation of natural coastal processes, following the HELCOM Recommendation 16/3 (1995).

The most opted coastal protection policy in Lithuania is limited intervention through coastal foredune and forest management, as well as through the submerged nourishment aimed to stabilize the coastal zone, particularly the recreational beaches. To fight coastal erosion, all forests and foredune ridges of the coastal zone have been classified as protected and preserved.

Coastal forests and dunes being the integral part of the coastal belt enjoy protection within the general nature conservation framework (Riepsas 1995; Stauskas 1995). They are, according to the Law on Forests, specifically regarded as a protected category. The foredune is regularly maintained and restored after every season of autumn and winter storms. Any new constructions in the coastal zone are allowed only behind the foredune. Maintenance of coastal foredune and forest plantations (restoration, fastening and revegetation of the foredune with marram grass and hybrid marram grass) is the principal technical coastal stabilization measure (Figure 2). It is a joint responsibility of local municipalities and administrations of Kursiu nerija national park and Pajuris regional park.

Application of sand, which is dredged from the Klaipeda Seaport gate for the submerged nourishment of the coastal zone in the nearshore is recommended as another important coastal stabilization measure applied at the mainland Baltic coast of Lithuania (Figure 3).

Figure 2: Eroded foredune fastened with fences and fascines in Pajuris regional park. Photo: E. Paplauskis, June 2001

Figure 3: Submerged nearshore nourishment at the Lithuanian mainland coast. Photo: V. Kaunas, April 2001

The only site along the entire Lithuanian Baltic coast, where "hard intervention" is recommended in the national Coastal Management Programme, is at the Palanga promenade pier, where the old jetty, which was removed in 1997, should be restored for shoreline and beach stabilization purposes.

4 Conclusion

Summarizing, we can claim that Lithuania currently possesses probably the most comprehensive ICZM policy instruments in the entire Baltic Sea region. Lithuania has relatively short coastline and rather well geographically expressed coastal region (or coastal zone in a broader sense). Therefore, its whole coastal management and planning system can serve as a good example of ICZM on the country level (Kavaliauskas 1995).

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